

Investigation of sudden death of calves after epileptic seizures due to hypomagnesaemia and hyperparathyroidism

Chevalier M.(1), Lebreton P.(2), Garnier C.(3), Rollin F.(1), Guyot H.(1)

(1) University of Liege, Faculty of Veterinary Medicine, Clinical Department of Production Animals

(2) NBVC Early Health Indicators, Dardilly, France

Sudden death of calves after epileptic seizures can be caused by metabolic disorders including hypomagnesaemia (with or without hypocalcaemia) but also hyperparathyroidism, a less known aetiology. Hypomagnesaemia is mainly observed on young calves exclusively fed with milk or milk substitute. Hyperparathyroidism could be due to congestion and hypertrophy of parathyroid gland and leads to hypercalcaemia and hypophosphataemia, but the exact aetiology remains unclear.

The purpose of this case report was to explain the epileptic seizures underwent by calves in a cattle herd with sudden death and decreased average daily gain (ADG).

A Montbeliard herd that experienced clinical signs of epileptic seizures in calves from the fifth week of life, was studied. The herd was constituted with 39 cows and 45 calves. Blood and urine biochemical assays were performed on sick calves to determine the aetiology of these clinical signs.

Tachycardia, nervousness and trampling, violent seizures of tetany during about 15 minutes and opisthotonos were present on 5 calves of whom 3 died. Furthermore, 9 calves presented a decreased ADG. Blood and urine assays revealed hypophosphataemia and hypomagnesaemia as well as hypocalciuria, hyperphosphaturia and hypomagnesuria. Deficiencies in selenium, iodine, iron and vitamins A, D3 and E have also been diagnosed in calves in this herd.

Calves were suffering from a hypothetic compensatory non-functional hyperparathyroidism with hypomagnesaemia associated here with normo- or hypocalcaemia and hypophosphataemia. Effect of PTH secretion is suspected to be inefficient as PTH receptor could be modified by magnesium deficiency and/or other factors. This condition can lead to seizures, muscular problems, heart attacks and anorexia. Such combination of hypomagnesaemia and hyperparathyroidism has been poorly described in the literature. This is probably a new metabolic disorder that young cattle have to face. Blood and urine biochemical assays are important tools in order to identify this pathological entity in calves. Moreover, PTH assays should be investigated in such cases in order to confirm the diagnosis.